

**LEGISLATIVE RESEARCH COMMISSION (LRC)
ENERGY POLICY ISSUES**

COMMITTEE MEETING

February 15, 2012

Questions and Answers

Robert B. Jackson, Nicholas Chair of Global Environmental Change, Nicholas School of the Environment, Duke University, spoke on recommendations concerning exploration for and extraction of shale gas in North Carolina.

Senator Blake: As I am listening to your comments, it's obvious that you want to be careful that we don't do it wrong. Did I detect that you are for finding the natural gas or are you against going to see if we have got natural gas?

Mr. Jackson: Option C.--none of the above. That is a serious answer. I am not for or against going to get the natural gas. I'm not for going to get the natural gas. That is not my job. That is not why I am standing up here.

Senator Blake: I can assume then that you are not against it—going for it?

Mr. Jackson: You can't assume that I'm not against it you can't assume that I am for it. That's not my job.

Senator Blake: You are doing better than a politician can do.

Senator Blake: Just a follow-up. I spent some days up in Pennsylvania where the Marcellus Shale is, and I went because I had been to some meetings down here with people that were absolutely horrified with the idea of doing the fracking process. They told me things here that were so horrible that I said I'm going to Pennsylvania to see if there is any truth in this. And almost everything I heard here, when I went to Pennsylvania, the county commissioner from the county that I was in, said that everything I had told him, he said you can quote me, that's him, that everything you have heard is absolutely a lie. So my concern is, let's don't spend forever looking for all of these things to hold up the process. I don't want any pollutants either. I am very concerned about that, but there has already been so much stuff done, you could almost go to Pennsylvania where I did with a list of things you want to find out and you would probably get that information. I am concerned that we get involved with our universities of whom I love, Duke especially, that we will spend years studying this stuff and then go ahead and do it, but look at the time we will lose. The same idea goes with building highways. We have spent billions of dollars in North Carolina because of some snail....or some endangered species. The environmental group holds up progress. Five years later we continue to go ahead and build the highway. No problem. So let's try to avoid that and I appreciate what you are saying. I have no idea about technology and the real facts that you do, but let's try to say well, let's move on and get the job done. Okay. And that's what I'm concerned about. Slowing the process up to the point five years from today we will still be arguing about whether we can get natural gas or whether we even have it. Thank you very much.

Mr. Jackson: I find it equally unproductive when people say that shale gas extraction always causes problems, is always going to pollute everyone's water, you know, it is just not true. So we have sampled many peoples' houses, most peoples' houses where you don't find that. You don't find any evidence for change and those people, in large part, are happy. On the other hand, in my view it is equally unproductive to suggest that those issues are all a lie or they don't exist. I can tell you my experience. I do this for a living. Those are not all lies. This is where I work. This is what I do. My interest is to understand the cases where, if and when something goes wrong, why does it go wrong and try to stop it happening somewhere else. So, neither one of those two perspectives, from my view, is particularly helpful.

Senator Rabon: Going back to Pennsylvania again and the methane that you found in the water there, I am assuming from what we heard and what you presented that there was no pre-drilling test on this water. Am I correct in that assumption?

Mr. Jackson: Sir, that is correct in our first study, we had no pre- and post-drilling tests for those.

Senator Rabon: And in those samples that you found methane, did you find saline, brine fracking material—any evidence that it came from the drilling, or was it simply methane?

Mr. Jackson: We looked for saline for brine in particular, so evidence of produced waters. We did not find that, we looked for a handful of things, Boron in particular was found in some fracturing fluids. We did note that. We did find stray gases. The reason for showing the slide, for instance, of Lennox, Pennsylvania, is that a separate case that does in fact have pre- and post-drilling evidence for stray gas migration into that well.

Senator Rabon: But you did not find the brine or the other fracking fluid in any different level than you found in the other test well?

Mr. Jackson: Yes, as I showed on the slide. That is correct.

Senator Rabon: So, really scientifically in itself, we can't really say that the methane then came from the fracking because we don't have pre and post and we don't have any other incriminating materials there. Am I correct on that?

Mr. Jackson: No. That would not be my interpretation of the data based on a lot of other data that I don't have time to show you in a 10-15 minute slot.

Senator Rabon: Then maybe we should go down another scientific path, but from the model you have shown me, you can't satisfy Koch's postulates are here.

Mr. Jackson: Why don't you give me a little more to go on?

Senator Rabon: A Koch's postulates means that is has to be reproducible.

Mr. Jackson: I guess that's why I'm asking for something more to go on. I guess I don't understand why that applies. Just give a little more information of what you mean because I don't see that connection.

Senator Rucho: Question for you. You talk about no rushing, and again, I could be a year or two off, I think, but hydro fracking has been done for 60 years. You know we have been drilling wells, natural gas, oil and the like for many, many years, horizontal

drilling has been done for the last 20. At what point, and what body of evidence do you need that you will be satisfied that this is as safe as it could be? For example, if we knew what we knew today would we ever fly in an airplane?

Mr. Jackson: It's true that hydraulic fracturing has been going on since the 1940s, horizontal drilling since the 1980s, so there is a long history there. That does not mean that there is nothing different about the way we are doing this today. We are not used to doing this in 500 atmospheres of pressure. We are not used to horizontal drills that are two and three miles distance over that 20 to 30 to 40 to 50 to 60 year time frame. It's the same, but it's not the same. Frankly, the question would we ever fly in an airplane, as long as somebody gets in the airplane first, I will go afterwards.

Senator Blake: In your document you said that wells that were within five, a certain distance from water wells, had more methane than further away. That is pretty obvious. If you have got natural gas down in that planet down in the core of the earth, occasionally historically it comes out of there. And it will end up having traces in your water well. One other thing I learned in Pennsylvania, I met a guy 80 years old and he was a third generation on the farm, and he said that his grandfather drank water out of that well. They have found traces of methane that didn't come from fracking, but they had methane in that well--a small trace. So the public, when we talk about potential problems in wells, we need to be able to define what it is we are talking about. What levels are we talking about? Apparently, methane won't kill you if the levels are low enough--a certain level of whatever it is. So if you have got, on these fracking wells, if you got five miles away, you have got more potential for methane and that doesn't say anything scientifically as to where it came from. Would you agree with that, my last point?

Mr. Jackson: No, I would not agree with that. Again, based on the fact that I don't have time today to go through the science, particularly the isotopic chemistry, the hydrogen isotopes, the carbon isotopes, we are doing new work with noble gases. It is absolutely true that there is natural thermogenic methane found deep underground, pretty much all over Pennsylvania. That is not to say that all thermogenic methane is the same, so that methane in almost all locations does not look like the methane that is coming out of the ground in a Marcellus gas well, so the fact that there is methane there does not mean that is all there naturally and does not mean that that methane is the same. And that is one reason we use the isotopic signatures. And then, just maybe to comment on the first point, which I think is a good one, I also think it is a bit of a misconception. When I was a boy, if I wasn't playing baseball, I was watching too much TV, and you watch the Beverly Hillbillies and Jed Clampet goes out and shoots the ground and up comes this bubbling crude. That used to be the way we found oil and gas. That is not how it's done nowadays. So companies don't use surface methane to say we are going to plant our shale gas well here. They use 3-D seismic imaging of strata that are a mile or more underground in many cases, at least in the Marcellus. So, there isn't, and industry will say, that there is no expectation that the methane you see at the surface is going to be higher above that shale gas. That shale gas is essentially everywhere. It's locked up in pores in those rocks and they don't use that as a signature to find it. So, I guess I don't think that that supposition is correct.